REMARKS

Claims 1-27 are now pending in this application. The final Office Action mailed September 27, 2001, rejected all of Claims 1-27. More specifically, the final Office Action rejected Claims 1-3, 8-11, 15, 16, 19, 22, 23, and 27 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,105,036 issued to Henckel. The final Office Action also rejected Claims 12-14, 21, and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over Henckel in view of U.S. Patent No. 5,784,553 issued to Kolawa et al. Additionally, the final Office Action rejected Claims 1, 4-7, 15, 17-19, and 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,157,933 issued to Celi, Jr. et al. in view of the nonpatent reference entitled JAVA 1.1, Second Edition, by Jaworski.

In response to applicant's arguments presented in the remarks accompanying the previous amendment filed June 25, 2001, the Office Action stated that the features upon which applicant relied were not recited in the claims. More specifically, the final Office Action stated that the feature of the present invention for constructing the complex data object without parsing or translating an explicit definition of the complex data object's structure was not recited in the rejected claims. The final Office Action also stated that features of the present invention providing directly executable instructions that are calls to a set of predefined functions, and calling the predefined functions, were not recited in Claim 15. Accordingly, applicant is amending the independent Claims 1, 8, 10, 15, and 19 for clarification purposes, to more particularly point out and distinctly claim the subject matter that applicant regards as being his invention. More specifically, applicant is amending Claims 1, 8, 10, 15, and 19 to more particularly point out and distinctly claim constructing the complex data object directly from the persistent representation, "without parsing or translating an explicit definition of the complex data object's structure." Applicant is also amending Claim 15 to more particularly point out and

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distinctly claim that "the directly executable instructions are calls to a set of predefined functions that are called by a program interpreter."

Applicant respectfully submits that none of the cited and applied references, either alone or in combination, teach or suggest constructing a complex data object "without parsing or translating an explicit definition" of the complex data object's structure. Upon entry of this amendment, all pending Claims 1-27 will include constructing the complex data object "without parsing and translating an explicit definition" of the complex data object's structure. Therefore, upon entry of this amendment, all pending claims in this application will recite patentable subject matter and the present application will be placed in condition for allowance. Prior to discussing in more detail the reasons why applicant believes that Claims 1-27 are allowable, brief descriptions of the present invention and the cited and applied references are presented.

SUMMARY OF THE PRESENT INVENTION

The present invention is generally directed to providing a method, system, and storage medium for recreating a complex data object from a persistent representation of the structure of the complex data object. The persistent representation includes a sequence of directly executable instructions that are used to recreate the structure of the complex data object. The directly executable instructions are calls to a library of predefined functions. The complex data object is constructed directly from the persistent representation by calling the predefined functions that correspond to the sequence of directly executable instructions. No parsing or translating of an explicit definition of the structure of the complex data object is performed in constructing the complex data object.

Significant advantages result from the unique methods, systems, and storage media provided by the present invention for recreating complex data objects. By providing a structure of the complex data object as a sequence of directly executable instructions that are calls to a set

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of predefined functions, the complex data object can be constructed without parsing and translating an explicit definition of the complex data object's structure. Thus, the present invention provides significant advantages by increasing the processing speed and reducing the strain on computer memory and processing resources.

SUMMARY OF HENCKEL

The patent issued to Henckel is directed toward a tool for assisting the user in developing multimedia presentation applications. Henckel discloses displaying a source code file with an ordered arrangement of object definitions of multimedia objects. The multimedia object definitions can selectively be displayed in either textual or multimedia representations in response to user input. The representations are inline within the ordered arrangement of object definitions, such that a visual indication of the arrangement of such object definitions in the source code file is maintained. However, Henckel fails to teach or suggest obtaining a persistent representation of the structure of a complex data object as a sequence of directly executable instructions that are calls to predefined functions. Henckel also fails to teach or suggest calling predefined functions corresponding to the sequence of directly executable instructions so as to construct the complex data object directly from the persistent representation without parsing and translating an explicit definition of the complex data object's structure.

SUMMARY OF CELI, JR. ET AL.

The patent issued to Celi, Jr. et al. is directed toward a method and apparatus for downloading multiple animated images on a Web page during browsing of a network with limited throughput. Celi, Jr. et al. disclose a method in which a Web page and associated Java applet with a default image are loaded. The loaded Java applet then displays the default image. After displaying the default image, the Java applet requests the Web server to deliver an image series, which is a list of related images. Once the first image in the series is downloaded, the

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Java animation applet prepares the image for display. The Java applet displays screen transition effects between the downloading of each subsequent image in the image series list. This creates the perception to the user of not waiting for additional information to download in the background. However, Celi, Jr. et al. fail to teach or suggest obtaining a persistent representation of the structure of the complex data object as a sequence of directly executable instructions that are calls to predefined functions. Celi, Jr. et al. also fail to teach or suggest calling predefined functions that correspond to the sequence of directly executable instructions so as to construct the complex data object directly from the persistent representation without parsing and translating an explicit definition of the complex data object's structure.

SUMMARY OF JAWORSKI

The nonpatent reference titled JAVA 1.1, Second Edition, by Jaworski, provides several examples of Java applets to illustrate different aspects of Java classes and methods. Jaworski discloses a Java applet that shows how to load and play audio files and images. Jaworski also discloses Java applets that may be implemented to perform functions such as displaying text, video, or images in a browser application. However, Jaworski fails to teach or suggest obtaining a persistent representation of the structure of the complex data object as a sequence of directly executable instructions, which are calls to predefined functions. Jaworski also fails to teach or suggest calling predefined functions that correspond to the sequence of directly executable instructions so as to construct the complex data object directly from the persistent representation without parsing and translating an explicit definition of the complex data object's structure.

SUMMARY OF KOLAWA ET AL.

The patent issued to Kolawa et al. is directed to a method and system for generating a test suite using dynamic symbolic execution for a computer program written in the Java programming language. Kolawa et al. purport to teach finding an input for causing a program

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element, such as a program statement, to be executed in a manner that is extendable to finding a minimal set of inputs for executing substantially every statement at least once. Kolawa et al. also disclose a Java virtual machine that utilizes stacks to hold variables. However, Kolawa et al. fail to teach or suggest obtaining a persistent representation of the structure of the complex data object as a sequence of directly executable instructions, which are calls to predefined functions. Kolawa et al. also fail to teach or suggest calling predefined functions that correspond to the sequence of directly executable instructions so as to construct the complex data object directly from the persistent representation without parsing and translating an explicit definition of the complex data object's structure.

REJECTION OF CLAIMS 1-3, 8-11, 15, 16, 19, 22, 23, AND 27

UNDER 35 U.S.C. § 102(e)

The final Office Action mailed September 27, 2001, maintained the anticipation rejections of Claims 1-3, 8-11, 15, 16, and 19, as set forth in the previous Office Action mailed February 28, 2001. The final Office Action also included, in the anticipation rejections, the new Claims 22, 23, and 27 that were added in the amendment filed June 25, 2001. In response to applicant's arguments presented in the remarks accompanying the previous amendment filed June 25, 2001, the final Office Action stated that applicant relied upon features that were not recited in the claims. More specifically, the final Office Action stated that the feature for constructing a complex data object without parsing and translating an explicit definition of the complex data object's structure was not recited in the rejected claims. The final Office Action also stated that the features for providing directly executable instructions as calls to a set of predefined functions and calling the predefined functions were not recited in Claim 15.

Accordingly, applicant is amending the rejected independent Claims 1, 8, 10, 15, and 19 for clarification purposes, to more particularly point out and distinctly claim the subject matter

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that applicant regards as being his invention. More specifically, applicant is amending Claims 1, 8, 10, 15, and 19 to more particularly point out and distinctly claim constructing the complex data object directly from the persistent representation "without parsing and translating an explicit definition" of the complex data object's structure. Applicant is also amending Claim 15 to more particularly point out and distinctly claim that the "directly executable instructions are calls to a set of predefined functions that are called by the program interpreter."

Applicant respectfully submits that Henckel fails to teach or suggest constructing a complex data object "without parsing and translating an explicit definition" of the complex data object's structure. In contrast, Henckel is limited to teaching the use of conventional interpretative program statements and definitions that explicitly specify the structure of the multimedia object and require parsing and translating. Henckel generates multimedia representations by using static data structures, such as trees, that are obtained by parsing and translating source code.

> Browser 34 typically operates by *parsing the source code provided by main block 31 to form a parse data structure such as a tree*, and then utilizing the data structure to generate graphical and/or audio data for output to display 22 and audio system 29, in a manner that is well understood in the art. (Col. 6, lines 31-36, emphasis added.)

Because Henckel relies on the use of conventional static data structures parsed from source code, applicant asserts that Henckel fails to teach or suggest obtaining a persistent representation of a complex data object of a sequence of directly executable instructions while constructing the complex data object "without parsing and translating an explicit structure of the complex data object's structure."

Therefore, Henckel fails to teach or suggest applicant's invention as recited in the amended independent Claims 1, 8, 10, 15, and 19 and their respective dependent Claims 2, 3, 9, 11, 16, and 27. Thus, applicant respectfully submits that Claims 1-3, 8-11, 15, 16, 19, and 27 are

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allowable. Claims 22 and 23 are computer-readable-medium and system format claims, respectively, and parallel the methods of Claims 1-7. Therefore, the analysis discussed above with respect to independent Claim 1 also applies to Claims 22 and 23. Thus, applicant respectfully submits that Claims 22 and 23 are allowable for the same reasons as Claim 1. Therefore, applicant respectfully requests the withdrawal of the Section 102(e) rejection of Claims 1-3, 8-11, 15, 16, 19, 22, 23, and 27.

REJECTION OF CLAIMS 12-14, 21, AND 24-26 UNDER 35 U.S.C. § 103(a)

The final Office Action mailed September 27, 2001, rejected dependent Claims 12-14, 21, and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over Henckel in view of Kolawa et al. The final Office Action cited Kolawa et al. as disclosing an interpreter that is a local stack-based virtual machine including a temporary storage array. The final Office Action stated that it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to utilize the stack-based virtual machine taught by Kolawa et al. in combination with the teachings of Henckel, because Henckel recognized that source code files may be an interpreted language.

Additionally, the final Office Action stated that applicant's previously submitted arguments relied upon features not recited in the claims. More specifically, the final Office Action stated that the feature for constructing the complex data object without parsing and translating an explicit definition of the complex data object's structure was not recited in the rejected claims. As amended, independent Claims 8, 10, and 19 recite constructing the complex data object "without parsing and translating an explicit definition of the complex data object's structure." Claims 12 - 14 depend from amended Claim 10. Claim 21 depends from amended Claim 19 and Claims 24 - 26 depend from amended Claim 8. Therefore, dependent Claims 12-14, 21, and 24 - 26 also include the limitation of constructing the complex data object without

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parsing and translating an explicit definition of the complex data object's structure.

As discussed above, Henckel fails to teach or suggest constructing the complex data object "without parsing and translating an explicit definition of the complex data object's structure." Rather, Henckel is limited to teaching the use of conventional interpretive program statements and definitions that explicitly specify the structure of a multimedia object and require parsing and translating. Similarly to Henckel, Kolawa et al. are also limited to teaching conventional interpretive Java program instructions that are represented as nodes in parse tree data structure. Kowala et al. fail to teach or suggest constructing a complex data object without parsing and translating an explicit definition of the complex data object's structure.

Therefore, applicant respectfully submits that Henckel and Kolawa et al., either alone or in combination, fail to teach or suggest constructing a complex data object "without parsing and translating an explicit definition of the complex data object's structure," as recited in Claims 8, 10, and 19 and their respective dependent Claims 12-14, 21, and 24-26. Thus, for at least the same reasons discussed above with respect to independent Claims 8, 10, and 19, dependent Claims 12-14, 21, and 24-26 are allowable and applicant respectfully requests the withdrawal of the Section 103(a) rejection of Claims 12-14, 21, and 24-26.

REJECTION OF CLAIMS 1, 4-7, 15, 17-19, AND 20 UNDER 35 U.S.C. § 103(a)

The final Office Action mailed September 27, 2001, rejected Claims 1, 4-7, 15, 17-19, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Celi, Jr. et al. in view of Jaworski. As discussed above, the final Office Action stated that applicant's previously submitted arguments relied upon features that were not recited in the rejected claims. The final Office Action stated that the feature for constructing the complex data object without parsing and translating an explicit definition of the complex data object's structure was not recited in the rejected claims. The final Office Action also stated that the features for providing directly

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executable instructions as calls to a set of predefined functions and calling the predefined functions were not recited in Claim 15.

As amended, independent Claims 1, 15, and 19 recite constructing the complex data object "without parsing and translating an explicit definition" of the complex data object's structure. Amended Claim 15 also recites that the "directly executable instructions are calls to a set of predefined functions that are called by the program interpreter." Claims 4 - 7 depend from amended Claim 1. Claims 17 and 18 depend from amended Claim 15, and Claim 20 depends from amended Claim 19. Therefore, all of Claims 1, 4 - 7, 15, 17 - 19, and 20 include the limitation of constructing the complex data object "without parsing and translating an explicit definition" of the complex data object's structure.

Applicant respectfully submits that Celi, Jr. et al. and Jaworski fail to teach or suggest constructing a complex data object "without parsing and translating an explicit definition" of the complex data object's structure. Rather, Celi, Jr. et al. and Jaworski are limited to teaching conventional techniques for displaying a multimedia object that involve parsing and translating an explicit structure of the multimedia object. More specifically, the Java applets taught by Jaworski and the applets embedded in the Web pages taught by Celi, Jr. et al. are conventional Java programs that can be downloaded over the Internet and executed on the recipient's machine. These types of conventional Java applets explicitly specify the structure of the multimedia objects and must be parsed and translated by the browser for display.

Therefore, applicant respectfully submits that Celi, Jr. et al. and Jaworski, either alone or in combination, fail to teach or suggest applicant's invention, as recited by Claims 1, 4-7, 15, 17-19, and 20. Thus, Claims 1, 4-7, 15, 17-19, and 20 are allowable and applicant respectfully requests the withdrawal of the Section 103(a) rejection of Claims 1, 4-7, 15, 17-19, and 20.

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CONCLUSION

In view of the foregoing, applicant respectfully submits that all the claims of the present application, Claims 1-27, are allowable over the cited and applied references, alone or in combination. Reconsideration and reexamination of the application are requested and allowance of the rejected claims and passage of the application to issue at an early date are solicited. If the Examiner has any questions or comments concerning this application, he is invited to contact the applicant's undersigned attorney at the number set forth below.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to the Commissioner for Patents, Washington, D.C. 20231, on the below date.
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VERSION WITH MARKINGS TO SHOW CHANGES MADE NOVEMBER 9, 2001

In the Claims:

Claims 1, 8, 10, 15, and 19 have been amended as follows:

1. (Twice Amended) A computer-implemented method for recreating a complex data object having a structure, the method comprising:

obtaining a persistent representation of the structure of the complex data object as a sequence of directly executable instructions, wherein the directly executable instructions are calls to a set of predefined functions;

interpreting the directly executable instructions as calls to a set of predefined functions; and

calling a predefined function corresponding to each directly executable instruction in the sequence of directly executable instructions so as to construct the complex data object directly from the persistent representation, without parsing and translating an explicit definition of the complex data object's structure.

8. (Twice Amended) A system for recreating a complex data object having a structure, the system comprising:

a persistent representation of the structure of the complex data object and containing a sequence of directly executable instructions, wherein the instructions are calls to a predefined set of data types and methods for creating complex data objects;

a library having the predefined set of data types and methods for creating complex data objects; and

a program interpreter for directly executing the instructions as a sequence of calls on the library so as to directly construct the complex data object from the persistent representation, without parsing and translating an explicit definition of the complex data object's structure.

10. (Twice Amended) A system for recreating a complex data object from a persistent representation of its structure, the system comprising:

a library having a predefined set of data types and methods for creating complex data objects; and

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a program interpreter for interpreting the contents of the persistent representation as a sequence of directly executable instructions, and for executing those instructions as a sequence of calls on the library so as to construct the complex data object directly from the persistent representation, without parsing and translating an explicit definition of the complex data object's structure.

15. (Amended) A storage medium containing a persistent representation of the structure of a multi[-]component data object as a sequence of instructions directly executable, wherein the directly executable instructions are calls to a set of predefined functions that are called by [on] a program interpreter implemented in a digital computer so as to recreate the structure of the multi[-]component data object, without parsing and translating an explicit definition of the multicomponent data object's structure.

19. (Twice Amended) A storage medium containing computer-executable instructions and data for interpreting a persistent representation of the structure of a complex data object as a sequence of directly executable virtual instructions for directly constructing the complex data object as a series of calls on a library of predefined functions, without parsing and translating an explicit definition of the complex data object's structure.

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